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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,068	07/22/2003	Arup Bhattacharyya	MI22-2362	8254
21567	7590	11/29/2004	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			WILSON, CHRISTIAN D	
			ART UNIT	PAPER NUMBER
			2824	

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,068

Applicant(s)

BHATTACHARYYA, ARUP

Examiner

Christian Wilson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 62-101 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 62-90 is/are allowed.
- 6) ☒ Claim(s) 91-101 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>07222003</u> | 6) <input checked="" type="checkbox"/> Other: <u>search history</u> |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 91, 96, and 98 – 101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee *et al.* in view of Noguchi.

Lee *et al.* (US 6,730,551) teaches a method of forming a memory device [Figure 3] comprising the steps of forming a buffer layer **12** over a substrate **10**, forming a first crystalline layer **14** comprising relaxed SiGe, forming a second crystalline layer **20** over the first crystalline layer comprising a strained lattice, forming a transistor gate **62** over the strained layer, and forming a pair of source/drain regions **80/82** proximate to the gate and extending into the first and second crystalline layers. Lee *et al.* does not discuss a capacitor connected to the source/drain regions. Noguchi (US 6,054,730) teaches a transistor on a SOI substrate [column 15, lines 50-60]. It would have been obvious to one of ordinary skill in the art to form the capacitor of Noguchi in the method of Lee *et al.* since Noguchi teaches that this configuration provides a reduction in leakage from the transistor and improves the boosting efficiency [column 4, lines 45-50].

Regarding claim 96, Lee *et al.* further teaches a thickness for the first and second crystalline layer of less than 2000 Å [column 4, lines 1-10].

Regarding claim 98, Lee *et al.* further teaches a strained silicon layer which has a lattice that matches the relaxed lattice on a one-to-one basis [column 4, lines 45-55].

Regarding claim 99, Lee *et al.* further teaches a strained SiGe layer which has a lattice that matches the relaxed lattice on a one-to-one basis [column 5, lines 60-65].

Regarding claims 100 and 101, Noguchi further teaches a n-type silicon first electrode [column 29, lines 45-50], a tantalum oxide (Ta_2O_5) dielectric material [column 29, lines 20-25], and a second n-type silicon electrode over the dielectric material. It would have been obvious to one of ordinary skill in the art to use the method of Noguchi to form a capacitor in the method of Lee *et al.* since this method provides a memory structure with improved speed and stability.

3. Claims 92 – 95 and 97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee *et al.* and Noguchi as applied to claim 91 above, and further in view of Fitzgerald.

Lee *et al.* as modified by Noguchi teaches the limitations of claim 91 above but does not discuss the crystallinity of the first and second crystalline layers. Fitzgerald (US 6,724,008) teaches a relaxed SiGe substrate with either a monocrystalline or polycrystalline first or second crystalline layer [column 2, lines 1-10; column 7, lines 20-30] and an active region contained in a single crystal of the first crystalline layer [Figure 10]. It would have been obvious to one of ordinary skill in the art to use the crystallinity of Fitzgerald in the method of Lee *et al.* since this provides both improved surface smoothness of the SiGe layer and a protective layer during processing.

Allowable Subject Matter

4. Claims 62 – 90 are allowed.

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5. The following is a statement of reasons for the indication of allowable subject matter: applicant discloses a novel method of forming an SOI device where, in the context of the entire claim, a plurality of islands are formed with crystals in the islands, and then using a metal layer to recrystallize a silicon and germanium layer.

Conclusion

6. A copy of the search history (EAST and STN) is enclosed.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian Wilson whose telephone number is (571) 272-1886.

The examiner can normally be reached on weekdays, 7:30 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Christian Wilson, Ph.D.
Primary Examiner
Art Unit 2824